Kommentarer från Svensk Förening för Neuroradiologi (SFNR) angående European Training Curriculum in Radiology.

Den europeiska utbildningshandboken för ST-utbildning i radiologi är indelad i tre nivåer och SFNR har i detta dokument kommenterat hur dessa tre nivåer är applicerbara till den svenska ST-utbildningen i radiologi och neuroradiologi.

- I paritet med SFMR's generella rekommendation för European Training Curriculum gäller i princip hela level I för alla ST-läkare i radiologi, undantagen är kommenterade.

- Kriterierna i level II är fördjupningen inom neuroradiologi, där det dock finns områden som alla bör känna till oavsett om man fördjupar sig mot neuroradiologi eller inte. SFNR har därför identifierat de viktigaste områdena för den generella fördjupningen under år 4-5, oavsett vilken inriktning man väljer för sin fördjupning.

- Kriterierna i level II är därmed indelade i två nivåer; en nivå för alla dem som gör ST i radiologi, och en för dem som fördjupar sig inom neuroradiologi eller påbörjar en ST-utbildning i neuroradiologi. Observera att om man planerar att göra EDiR gäller hela level I och II.

- För grenspecialiteten neuroradiologi gäller level III Neuroradiologi (B-III-9) och level II Head and Neck (B-II-7)med kommentarer.

- Level III Head and Neck (B-III-6) ingår inte i grenspecialiteten neuroradiologi, utan är en ytterligare fördjupning i Head and Neck radiologi enligt ESHNR.

Level I

B-I-10 Neuroradiology

KNOWLEDGE

• To describe normal anatomy and normal variants of the brain, skull, skull base, spine and spinal cord peripheral nervous system
• To describe the normal anatomy of the craniocervical and spinal arterial and venous system and its relevance to interventional neuroradiology
• To describe typical endovascular and percutaneous approaches to common disorders in interventional neuroradiology (brain, skull, skull base and spine/spinal cord)
• To recall common congenital lesions of the brain, skull, skull base, spine, spinal cord and peripheral nervous system
• To understand the rationale for selecting certain imaging techniques, and the use of contrast administration, in diagnosing diseases of the central and peripheral nervous system
• To understand imaging features of stroke, haemorrhage and other common vascular lesions of the brain and spinal cord and to differentiate these from other disorders
• To understand imaging features of traumatic brain injury and spinal trauma and to comprehend their neurological sequelae
• To understand imaging features and differential diagnoses of white matter disease, inflammation and degeneration
• To understand imaging features of benign and malignant tumours of the skull, skull base, brain, spine, spinal cord and cranial and peripheral nerves
• To appreciate the role of nuclear medicine, including PET/PET-CT, in the diagnostic evaluation of disorders involving the central nervous system, skull, skull base, and spine

Knowledge: Hela detta avsnitt gäller för alla som gör ST-utbildning i radiologi.

SKILLS

• To perform ultrasonographic examinations of the carotid arteries, including Doppler-sonographic studies ***(detta är inte ett krav att utföra, men en rekommendation om möjlighet finns)***
• To observe ultrasonographic and Doppler-sonographic studies of intracranial vessels ***(detta är inte ett krav men en rekommendation om möjlighet finns)***
• To perform basic vascular catheterisation and percutaneous techniques under supervision ***(ligger under interventionsdelen)***
• To observe diagnostic and interventional supraaortic digital subtraction angiographies ***(neurofördjupning/ST i neuroradiologi)***
• To observe diagnostic and interventional spinal digital subtraction angiographies ***(neurofördjupning/ST i neuroradiologi)***
• To observe image-guided puncture of the spine with and without contrast media application (myelography, diagnostic lumbar puncture) ***(neurofördjupning/ST i neuroradiologi)***

• To plan CT examinations in patients with common disorders of the brain, skull, skull base, and spine and to adapt them to the individual situation with a dose as low as reasonably achievable, including the decision for or against contrast administration
• To plan MRI examinations in patients with common disorders of the brain, skull, skull base, and spine and to adapt them to the individual situation, including the decision for or against contrast administration
• To perform proper common post-processing tasks for imaging studies of the brain spine/spinal cord and nerve roots, including multi-planar reformations (MPR), maximum intensity projections (MIP) and vessel analysis tools

Skills: Detta avsnitt gäller för alla som gör ST-utbildning i radiologi med undantag för de kriterier som kommenterats.

COMPETENCES AND ATTITUDES
• To justify diagnostic imaging examinations and/or interventional procedures of the brain, skull and spine
• To choose the best-suited method for evaluating disorders of brain, skull and spine
• To communicate with the patient in order to obtain informed consent prior to diagnostic imaging and/or interventional procedures of the brain, skull and spine
• To choose optimal imaging parameters for radiographic, ultrasonographic/Doppler-sonographic, CT and MRI examinations of the brain, skull and spine
• To apply techniques to reduce exposure doses for radiographic and CT examinations of the brain, skull and spine
• To design imaging protocols for CT examinations of the brain, skull and spine ***('to design' innebär här att välja rätt typ av protokoll för den aktuella undersökningen)***
• To design imaging protocols for MRI examinations of the brain, skull and spine ***('to design' innebär här att välja rätt typ av protokoll för den aktuella undersökningen)***
• To supervise and teach technical staf to ensure that appropriate images of the brain, skull and spine are obtained
• To interpret and report radiographs, ultrasonographic/Doppler-sonographic examinations, CT studies and MRI examinations of the brain, skull and spine
• To report oncological studies of the brain, skull and spine
• To appreciate own limitations and to identify when it is appropriate to obtain assistance in interpreting and reporting images of the brain, skull and spine
• To identify urgent and/or unexpected findings in imaging examinations of the brain and spine and to communicate these timely and properly
• To communicate with patients and their relatives in order to explain their imaging findings of the brain, skull and spine
• To participate in and to perform under supervision at multi-disciplinary conferences, neurovascular boards and tumour boards for diseases of the brain, skull and spine

Competences and attitudes: Hela detta avsnitt gäller för alla som gör ST-utbildning i radiologi.

B-I-7 Head and Neck Radiology

I Sverige är odontoradiologi en egen specialitet och kriterierna gällande dentala området är inte ett krav i ST-utbildningen i radiologi.

KNOWLEDGE

• To describe the normal anatomy of the head and neck, including paranasal sinuses, the oral cavity, pharynx and larynx, the inner ear, salivary glands, thyroid and parathyroid glands, thoracic inlet, orbit, teeth and the temporomandibular joint
• To recall common congenital lesions of the head and neck, including paranasal sinuses, the oral cavity, pharynx and larynx, the inner ear, orbit, teeth and the temporomandibular joint
• To understand common manifestations of diseases of the eye and orbit including trauma, foreign bodies, inflammation and tumours
• To understand common imaging manifestations of maxillo-facial trauma and tumours and disorders of the teeth
• To understand common imaging manifestations of lesions and abnormal function of the temporomandibular joint
• To understand common imaging manifestations of disorders of the thyroid, parathyroid and salivary glands
• To be aware of the role of radionuclide imaging in disorders of the thyroid and parathyroid glands
• To be aware of the role of radionuclide imaging in the functional evaluation of endocrine abnormalities
• To understand common imaging manifestations of trauma, inflammation, infection and tumours of the paranasal sinuses, oral cavity, larynx and pharynx
• To understand the role of ultrasound- and CT-guided puncture of salivary glands, lymph nodes and the thyroid gland

Knowledge: Hela detta avsnitt gäller för alla som gör ST-utbildning i radiologi (tänder ej ett krav).

SKILLS

• To perform fluoroscopic examinations of the head and neck region, including barium swallows and sialography ***(Sialografier är inte ett krav men en rekommendation om det finns möjlighet att i alla fall observera. Genomlysningsundersökningar av hypofarynx/esofagus ligger vanligen under gastroradiologin.)***
• To perform ultrasound examinations of the neck, including thyroid, parathyroid lymph nodes and salivary glands
• To plan a CT examination in patients with common disorders of the head and neck region and to adapt it to the individual situation with a dose as low as reasonably achievable
• To plan an MRI examination of the head and neck region and to adapt it to the individual situation
• To perform proper common post-processing tasks for imaging studies of the head and neck region including multi-planar reformations (MPR) and maximum intensity projections (MIP)
• To observe image-guided interventional techniques of the head and neck region, e.g. fine needle aspiration biopsy of the thyroid gland

Skills: Hela detta avsnitt gäller för alla som gör ST-utbildning i radiologi.

COMPETENCES AND ATTITUDES

• To justify diagnostic imaging examinations and/or interventional procedures of the head and neck
• To choose the best-suited method for evaluating disorders of the head and neck
• To communicate with the patient in order to obtain informed consent prior to diagnostic imaging and/or interventional procedures of the head and neck
• To choose optimal imaging parameters for radiographic, ultrasonographic, CT and MRI examinations of the head and neck
• To apply techniques to reduce exposure doses for radiographic and CT examinations of the head and neck
• To supervise and design imaging protocols for CT examinations of the head and neck, including staging examinations in tumours of the head and neck region and to adapt the examination depending on the imaging findings
• To supervise pre-defined imaging protocols for MRI examinations of the head and neck and to design MRI protocols for common indications
• To supervise and teach technical staf to ensure that appropriate images of the head and neck region are obtained
• To recognize suboptimal image quality and its causes
• To interpret and report radiographs, ultrasonographic examinations, CT studies and MRI examinations for common diseases of the head and neck region
• To report oncological studies of the head and neck region according to international standards (TNM) applicable to the specific situation
• To appreciate own limitations and to identify when it is appropriate to obtain assistance in interpreting and reporting images of the head and neck region
• To identify urgent and/or unexpected findings in imaging examinations of the head and neck region and to communicate these timely and properly
• To communicate with patients in order to explain the imaging findings in the head and neck
• To attend and to conduct under supervision multi-disciplinary conferences and tumour boards for diseases of the head and neck region

Compentences and attitudes: Hela detta avsnitt gäller för alla som gör ST-utbildning i radiologi.

Level II

B-II-10 Neuroradiology

KNOWLEDGE

NORMAL ANATOMY
• To have an in-depth understanding of the normal anatomy of the brain and spine including the skull, skull base, brain, spine, spinal cord and peripheral nervous system
• To confidently detect and describe normal imaging findings of the brain and spine on X-ray, ultrasound, CT and MRI
• To confidently delineate and describe the skull, skull base, and spine on conventional radiography

• To confidently delineate the cortex, white matter, basal ganglia, ventricles, cisterns and cranial nerves on CT and/or MRI of the brain
• To confidently delineate the vertebral bodies, spinal canal, intervertebral discs, dural sac, spinal cord and cauda equina on CT and/or MRI of the spine
• To confidently delineate the aortic arch, carotid and vertebral arteries, intracranial arteries and the circle of Willis, spinal and spinal cord vascularisation on angiography
• To describe normal variants of the brain and spine and differentiate these from pathology

Normal Anatomy: Hela detta avsnitt ingår för alla som gör ST-utbildning i radiologi.

CONGENITAL AND DEVELOPMENTAL ABNORMALITIES
• To describe the imaging features of malformations of cortical development, including focal cortical dysplasia, polymicrogyria, heterotopia (subependymal, focal subcortical, laminar), lissencephaly / pachygyria, (hemi)megalencephaly, microlissencephaly, schizencephaly
• To describe the imaging features of agenesis and dysgenesis of the corpus callosum and of holoprosencephaly (lobar, alobar, semilobar)
• To describe the imaging features of hindbrain and posterior fossa malformations, including the Chiari malformations, the Dandy Walker spectrum and the molar tooth malformations (including Joubert syndrome)
• To describe the imaging features of white matter injury of the premature brain / periventricular leukodystrophy (PVL)
• To describe the imaging features of hypoxic ischemic encephalopathy of the mature infant after severe acute asphyxia
• To describe the imaging features of hypoxic ischemic encephalopathy of the mature infant after prolonged partial hypoxia
• To describe the neuro-imaging features, extracranial manifestations, diagnostic criteria and clinical features of neurofibromatosis type I
• To describe the neuro-imaging features, extracranial manifestations, diagnostic criteria and clinical features of neurofibromatosis type II
• To describe the neuro-imaging features, extracranial manifestations, diagnostic criteria and clinical features of tuberous sclerosis
• To describe the neuro-imaging features, extracranial manifestations, diagnostic criteria and clinical features of Sturge-Weber disease
• To describe the common imaging features of segmental vascular syndromes
• To describe the common imaging features of inherited metabolic conditions and leukodystrophies

Congenital and developmental abnormalities: Detaljkunskap om detta avsnitt gäller för fördjupningen i neuroradiologi/ST i neuroradiologi, med undantaget av Chiari I som ingår för alla som gör ST-utbildning i radiologi. (Övriga medfödda och utvecklingsmässiga avvikelser skall kunna detekteras även av allmänradiologi enligt level I.)

NEUROVASCULAR
• To list the major types of stroke

• To describe the relevance of the “time is brain” approach to the imaging evaluation of patients with stroke
• To describe comprehensive stroke evaluation parameters for MRI and CT in patients with stroke, including diffusion-weighted imaging, perfusion-imaging, CTA and MRA
• To list the perfusion parameters relevant for stroke imaging and to describe their relevance and limitations
• To list and describe the main neuroradiological interventions in patients with ischaemic stroke
• To describe the diagnostic and therapeutic approach in patients with ischemic strokes of the posterior circulation/basilar artery occlusion
• To describe interventional approaches to intracranial stenoses ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features, relevant clinical features and imaging algorithm in patients with venous stroke/intracranial venous thrombosis
• To describe the imaging and clinical features in patients with subarachnoid hemorrhage (SAH)
• To describe the typical imaging evaluation algorithm in patients with spontaneous SAH
• To list the major complications and describe their respective imaging features in patients with SAH
• To describe the imaging features and relevant hemodynamic parameters in patients with vasospasms ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To differentiate atypical and typical intracerebral haemorrhages
• To list the major causes for atypical and typical intracerebral haemorrhages
• To describe the imaging algorithms in patients with atypical and typical intracerebral haemorrhages
• To list the different types of intracranial and extracranial vascular malformations
• To describe the imaging features and therapeutic approaches in patients with intracranial vascular malformations including arteriovenous malformations, dural arterio-venous fistulas, cavernous haemangiomas and carotid-cav- ernous sinus fistulas ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features, differential diagnoses and relevance of developmental venous anomalies
• To describe the imaging features, differential diagnoses and relevance of capillary teleangectasias ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features of the different types of intracranial aneurysms: secular, dissecting, fusiform, giant, infectious ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features of intra/extracranial arterial dissections
• To describe the imaging features of posterior reversible encephalopathy syndrome
• To describe cerebrovascular lesions related to arterial hypertension
• To describe the typical imaging evaluation and features of brain death
• To describe the imaging and clinical features in patients with venous occlusive disease
• To describe the imaging features, differential diagnoses and relevance of cavernous malformations
• To describe the imaging features of non-atherosclerotic, non-hypertensive cerebrovascular diseases (Moya-Moya, CADASIL) ***(fördjupning i neuroradiologi/ST i neuroradiologi)***

Neurovascular: Detta avsnitt gäller för alla som gör ST-utbildning i radiologi med undantag av de kriterier som kommenterats.

NEUROTRAUMA
• To list the typical imaging algorithms for patients with acute traumatic injury to the brain
• To describe the typical imaging features and basic clinical features in patients with epidural hematoma
• To describe the typical imaging features and basic clinical features in patients with subdural hematoma
• To describe the typical imaging features and basic clinical features in patients with traumatic subarachnoidal hemorrhage
• To describe the typical imaging features and basic clinical features in patients with traumatic contusions of the brain parenchyma
• To describe the typical imaging features and warning signs for elevated intracranial pressure
• To describe the typical imaging features of fractures of the skull and skull base including the temporal bone
• To describe the typical imaging features and clinical features in children with non-accidental injury
• To describe the typical imaging features of vascular traumatic injury of the intra- and extracranial vessels

Hela detta avsnitt gäller för alla som gör ST-utbildning i radiologi.

INTRACRANIAL TUMOURS
• To list the most common intracranial tumours
• To describe the typical imaging manifestations of intracranial metastases of various primary tumours
• To list the different WHO grade of astrocytomas/gliomas
• To describe the imaging features and basic clinical features of astrocytomas
• To describe the imaging features and basic clinical features of pilocytic astrocytomas
• To describe the imaging features, basic clinical features, location and association of giant cell astrocytomas
• To list the typical imaging features and locations of the various forms of brain stem tumours
• To describe the imaging features and basic clinical features of optic pathway gliomas
• To describe the imaging features and basic clinical features of ependymomas
• To describe the imaging features and basic clinical features of medulloblastomas
• To describe the basic imaging features of atypical teratoid and rhabdoid tumors (ATRT)
• To describe the imaging features and basic clinical features of plexus papilloma and plexus carcinoma
• To describe the imaging features and basic clinical features of primary and secondary lymphoma of the brain
• To describe the imaging features, basic clinical features and differential diagnosis of sellar and perisellar tumours
• To describe the imaging features and basic clinical features of pituitary micoadenomas and macroadenomas

• To describe the imaging features and basic clinical features of tumours of the pineal gland
• To describe the imaging features and basic clinical features of meningeomas
• To list imaging features of atypical meningeomas/meningosarcomas/hemangiopericytomas
• To list the basic imaging features and location of tuber cinereum hamartoma
• To list the basic imaging features of Lhermitte-Duclos syndrome and its association with Cowden syndrome
• To describe the imaging features and basic clinical features of oligodendroglioma
• To describe the imaging features of ganglioglioma, gangliocytoma and dysembryoplastic neuroepithelial tumour (DNET)
• To describe the imaging features and basic clinical features of schwannomas of the cranial nerves including vestibular schwannoma/"acoustic neuroma", trigeminal schwannoma and facial nerve schwannoma
• To describe the imaging features of chordoma of the clivus
• To describe the imaging features and to differentiate tumours of the orbits and temporal bone
• To describe the imaging features and to differentiate tumours of the skull and skull base

Intracranial tumours: Detaljkunskap om detta avsnitt gäller framförallt för fördjupningen i neuroradiologi/ST i neuroradiologi med undantag av första kriteriet: ' To list the most common intracranial tumours' samt kriterierna gällande meningeom och schwannom som gäller för alla som gör ST-utbildning i radiologi.

NEUROINFLAMMATORY, NEUROINFECTIOUS AND NEURODEGENERATIVE DISORDERS
• To describe the typical age-related changes to the brain
• To describe the typical and atypical imaging features and clinical features of multiple sclerosis (MS)
• To differentiate the appearance of demyelinating white matter lesions from age-related white matter changes
• To describe the typical imaging features and clinical features of patients with dementia of the Alzheimer type, as well as of other forms of dementia ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To have a basic understanding of the imaging features in Parkinson's disease and in atypical Parkinson syndromes, including multi-system atrophy and progressive supranuclear palsy ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the typical CNS imaging features and basic clinical features of Morbus Wilson ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features and basic clinical features of acute and chronic hepatic encephalopathy ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features and basic clinical features of exogenoeus toxic and acquired metabolic conditions (osmotic demyelination syndrome, hyper/hypoglycemia, iron and copper metabolic disorders, ethanol abuse) ***(fördjupning i neuroradiologi/ST i neuroradiologi)***

• To have an in-depth understanding of the typical and atypical imaging features of herpes simplex virus (HSV) infections of the brain, and understand the therapeutic concepts and urgency of HSV infections of the brain
• To describe the imaging features and the limitations of imaging in patients with meningitis
• To list the typical complications of meningitis and to describe their imaging features
• To describe the typical imaging features and basic clinical features of the different stages of intracranial abscess formation
• To describe the typical imaging features and basic clinical features of tuberculous meningitis and intracranial tuberculomas ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To have a basic understanding of congenital infections of the brain including toxoplasmosis, CMV, rubella and HSV ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the typical imaging features and basic clinical features of sarcoidosis ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the typical intracranial imaging features and basic clinical features of CNS vasculitis ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the typical intracranial imaging features and basic clinical features of HIV infection of the brain ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the typical imaging features and basic clinical features of prion infections ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the typical imaging features and basic clinical features of fungal infections ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the typical imaging features and causes of therapy associated changes to the brain, e.g. after radiation therapy and after chemotherapy ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the typical imaging features of paraneoplastic syndromes involving the central nervous system ***(fördjupning i neuroradiologi/ST i neuroradiologi)***

Neuroinflammatory, neuroinfectious and neurodegenerative diseases: Detta avsnitt gäller för alla som gör ST-utbildning i radiologi med undantag av de kommenterade kriterierna.

HYDROCEPHALUS
• To have a basic understanding of the production, flow and resorption of CSF
• To list and to differentiate the different types of hydrocephalkus and their respective causes
• To describe the typical imaging features and clinical features of normal pressure hydrocephalus
• To describe the typical imaging features, causes and clinical features of non-communicating hydrocephalus
• To describe the typical imaging features, causes and clinical features of CSF malabsorption ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To have a basic understanding of the production, flow and resorption of CSF
• To describe the typical imaging features and list the major causes of aqueductal stenosis
• To describe the method of imaging-based flow assessment of the CSF ***(fördjupning i neuroradiologi/ST i neuroradiologi)***

• To have a basic understanding of the different therapeutic approaches to hydrocephalus, including shunt placement and third ventriculostomy

Hydrocephalus: Detta avsnitt gäller för alla som gör ST-utbildning i radiologi med undantag av de kommenterade kriterierna.

SPINE
• To describe the imaging features and basic clinical features of spinal malformations including spina bifida aperta, spina bifida occulta, meningomyelocele, dermal sinus, split cord malformations, scoliosis ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To differentiate stable and unstable fractures of the spine
• To differentiate between benign and malignant vertebral compression fractures
• To describe the imaging features of myelopathy and to list its common causes ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the typical imaging features of spinal metastases including the criteria for cord compression
• To describe the typical imaging features and clinical features in spinal cord ischemia ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To list the most common intraspinal tumours
• To describe the imaging features and basic clinical features of spinal cord tumours (ependymoma, astrocytoma, haemangioblastoma) ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features and basic clinical features of spinal meningeomas ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features and basic clinical features of transverse myelitis (TM), acute disseminated encephalomyelitis (ADEM), neuromyelitis optica (NMO) ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features and basic clinical features of spinal manifestations of MS
• To describe the imaging features and basic clinical features of infectious diseases of the spine and spinal cord including spondylodiscitis
• To describe the imaging features and basic clinical features of spinal vascular malformations ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features and basic clinical features of syrinx formation and hydromyelia ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features of chordomas of the spine ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To have an in-depth knowledge of the imaging features of degenerative diseases of the spine disc and facet joints
• To describe percutaneous and endovascular interventional procedures of the spine/spinal cord ***(fördjupning i neuroradiologi/ST i neuroradiologi)***

Spine: Detta avsnitt gäller för alla som gör ST-utbildning i radiologi med undantag av de kommenterade kriterierna.

EPILEPSY
• To list the major causes of seizures in pediatric and adult population
• To describe the typical imaging evaluation algorithm in patients with seizures

• To describe the imaging features of mesial temporal sclerosis ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features of status epilepticus ***(fördjupning i neuroradiologi/ST i neuroradiologi)***

Epilepsy: detta avsnitt gäller för alla som gör ST-utbildning i radiologi med undantag av de kommenterade kriterierna.

PERIPHERAL NERVOUS SYSTEM
• To describe the typical imaging evaluation algorithm and features of brachial plexopathy
• To describe the typical imaging evaluation algorithm and features of lumbosacral plexopathy
• To describe the typical imaging evaluation algorithm in patients with entrapment neuropathies
• To describe the imaging features of tumoural and inflammatory lesions of the peripheral nerves

Peripheral nervous system: detta avsnitt gäller för fördjupning i neuro/muskuloskeletal/ST i neuroradiologi

SKILLS

• To choose the most appropriate imaging examination according to the clinical problem in neuroradiology
• To choose an appropriate interventional procedure (endovascular or percutaneous) according to the clinical problem in neuroradiology ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To choose the most suitable contrast material and its optimal use according to the imaging technique and the clinical problem in neuroradiology
• To observe and/or perform under supervision ultrasound of brain in the infant ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To observe and/or perform under supervision Doppler sonography of the intracranial vessels ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To observe and/or perform under supervision diagnostic neuroangiography ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To observe and/or perform under supervision intraarterial thombolysis in patients with ischaemic stroke ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To observe and/or perform under supervision mechanical recanalisation in patients with ischemic stroke ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To observe and/or perform under supervision neurointerventional therapy in patients with acute basilar artery occlusion***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To observe and/or perform under supervision endovascular treatment of intracranial aneurysms ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To observe and/or perform under supervision spinal angiography ***(fördjupning i neuroradiologi/ST i neuroradiologi)***

• To observe and/or perform under supervision disk, vertebral and facet interventional procedures included discography and biopsy ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To confidently plan a CT examination of the brain and spine and to tailor it to the individual situation, with a dose as low as reasonably achievable
• To plan CT perfusion and MR perfusion studies of the brain including the volume and rate of application of contrast medium and the number of acquisitions ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To confidently plan an MRI examination of the brain and spine and to tailor it to the individual situation in regard to the potential use of intravenous contrast medium and spatial resolution
• To plan and perform advanced CT and MRI examinations including perfusion CT and MR, difusion tensor imaging, functional MR imaging, and proton MR spectroscopy ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To confidently perform proper post-processing tasks of neuroradiological studies, including multi-planar reformations (MPR), maximum intensity projections (MIP), minimum intensity projections (MinIP), DTI, functional MRI and fusion images ***(fördjupning i neuroradiologi/ST i neuroradiologi)***

Skills: detta avsnitt gäller för alla som gör ST-utbildning i radiologi med undantag av de kommenterade kriterierna.

COMPETENCES AND ATTITUDES
• To confidently justify diagnostic imaging examinations and/or interventional procedures of the brain, skull, skull base, spine, spinal cord and peripheral nervous system
• To confidently choose the best-suited method for evaluating disorders of the brain, skull, skull base, spine, spinal cord and peripheral nervous system
• To communicate with the patient in order to obtain informed consent prior to diagnostic imaging and interventional procedures of the brain, skull, skull base, spine, spinal cord and peripheral nervous system
• To confidently choose optimal imaging parameters for radiographic, ultrasonographic, CT and MRI examinations
• of the brain, skull, skull base, spine, spinal cord and peripheral nervous system
• To confidently apply techniques to reduce exposure doses for radiographic and CT examinations of the brain, skull, skull base, spine
• To design a time-saving imaging algorithm and to define standard operating procedures for imaging patients with stroke
• To confidently perform and interpret a comprehensive imaging evaluation in patients with stroke
• To confidently design imaging protocols and standard operating procedures for CT examinations of the brain, skull, skull base, spine, spinal cord, peripheral nervous system, including the appropriate application of intravenous contrast, positioning, spatial and temporal resolution
• To confidently design imaging protocols and standard operating procedures for MRI examinations of the brain and spine, including the appropriate application of intravenous contrast, spatial and temporal resolution
• To supervise and teach technical staf to ensure that appropriate images of the brain, skull, skull base, spine, spinal cord, peripheral nervous system are obtained

• To confidently judge the quality of imaging examinations in neuroradiology and to devise strategies to improve image quality
• To confidently interpret and report radiographs, ultrasonographic examinations, CT studies and MRI examinations of the brain and spine
• To report oncological studies of the brain according to international standards applicable to the specific situation
• To appreciate own limitations and to identify when it is appropriate to obtain assistance in interpreting and reporting images of the brain, skull, skull base, spine, spinal cord, peripheral nervous system
• To confidently identify urgent and/or unexpected findings in imaging examinations of the brain, skull, skull base, spine, spinal cord, peripheral nervous system and to communicate these timely and properly
• To communicate with patients and their relatives in order to explain their imaging findings of the brain and spine
• To participate in and/or conduct multi-disciplinary conferences, vascular boards, and tumour boards for diseases of the brain, skull, skull base, spine, spinal cord, peripheral nervous system

Competences and attitudes: Detta avsnitt gäller för alla som gör ST-utbildning i radiologi inom de områden som identifierats under 'Knowledge' och 'Skills'.

För de som fördjupar sig inom neuroradiologi/påbörjar ST i neuroradiologi gäller avsnittet 'Competences and attitudes' hela II.

B-II-7 Head and Neck Radiology

KNOWLEDGE

NORMAL ANATOMY
• To have a good knowledge of the temporal bone, facial skeleton, skull base, cranial nerves, orbits and visual pathways, sinuses, pharynx, oral cavity, mandible, teeth, temporomandibular joints, salivary glands, larynx, neck, deep spaces of the face and neck, thoracic inlet and brachial plexus, as well as the thyroid gland and parathyroid glands
• To describe normal variants of the temporal bone, facial skeleton, skull base, cranial nerves, orbits and visual pathways, sinuses, pharynx, oral cavity, mandible, teeth, temporomandibular joints, salivary glands, larynx, neck, deep spaces of the face and neck, thoracic inlet and brachial plexus, as well as the thyroid gland and parathyroid glands and to differentiate these from disease
• To describe the terminology for describing the site of lymph nodes in the head and neck region

Normal anatomy: hela detta avsnitt gäller för alla som gör ST-utbildning i radiologi.

TEMPORAL BONE

• To list and to describe the imaging features of congenital disorders leading to deafness (e.g. cochlear aplasia/hypoplasia, Mondini malformation, large endolymphatic sac anomaly (LESA) / large vestibular aqueduct syndrome (LVAS) ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To list disorders leading to secondary deafness including otosclerosis, Menière's disease, and temporal bone inflammatory disease ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features and basic clinical features of disorders leading to secondary deafness including otosclerosis, Menière's disease, temporal bone inflammatory disease, and tumours of the cerebellopontine angle ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To confidently delineate the course of the facial nerve in its different components
• To describe the imaging features and basic clinical features of tumours of the temporal bone and to distinguish these from each other ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features and basic clinical features of tumours of the cerebellopontine angle and to distinguish these from each other
• To describe the imaging features and basic clinical features of traumatic lesions and fractures of the temporal bone
• To describe the imaging features and basic clinical features of cholesteatoma
• To differentiate different pathologies of the external auditory canal, including atresia and tumourous lesions ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To differentiate different pathologies of the middle ear ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To be familiar with the different types of cochlea implants and their respective MRI compatibility / noncompatibility (including specific precautions) ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To list the various causes of vascular tinnitus and to describe their respective imaging features ***(fördjupning i neuroradiologi/ST i neuroradiologi)***

Temporal bone: detta avsnitt gäller framförallt för fördjupningen i neuroradiologi/ST i neuroradiologi, men undantag av de kriterier som inte kommenterats och därmed gäller för alla som gör ST-utbildning i radiologi

FACIAL SKELETON, SKULL BASE AND CRANIAL NERVES
• To list the different neoplasms of the clivus and to describe their respective imaging appearance, including meningioma, macroadenoma and clivus chordoma ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features and basic clinical features of lesions of the jugular foramen, including glomus tumour / paraganglioma, jugular bulb pseudolesion, jugular bulb diverticulum, dehiscent jugular bulb, jugular foramen schwannoma, and jugular foramen meningioma ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features and basic clinical features of difuse diseases of the skull base, including fibrous dysplasia, plasmocytoma, Langerhans cell histiocytosis, chondosarcoma and metastases ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the normal anatomy and function of the cranial nerves and to list common pathologies
• To list and categorize traumatic lesions of the facial skeleton and to be familiar with complications and therapeutic consequences

• To describe the typical imaging features of neoplasms of the mandible and maxilla ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To understand the imaging features of dentigerous cysts and odontogenic keratocysts ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To understand the imaging features of infectious and inflammatory lesions of the mandible, maxilla and skull base, including osteomyelitis ***(fördjupning i neuroradiologi/ST i neuroradiologi)***

Facial skeleton, skull base and cranial nerves: detta avsnitt gäller framförallt för fördjupningen i neuroradiologi/ST i neuroradiologi med undantag av de kriterier som inte är kommenterade och därmed gäller för alla som gör ST-utbildning i radiologi

ORBIT AND VISUAL PATHWAYS
• To describe the imaging features and basic clinical features of congenital lesions of the orbit, including coloboma
• To describe the imaging features and basic clinical features of typical tumours of the orbit in children including dermoid and epidermoid cysts, cavernous haemangioma, lymphangioma, rhabdomyosarcoma and retinoblastoma
• To describe the orbital manifestations of neurofibromatosis type I
• To describe the imaging features and basic clinical features of infectious and inflammatory disorders of the orbits including optic neuritis, abscesses, sarcoidosis and idiopathic inflammatory disorders
• To describe the imaging features and basic clinical features of benign tumours of the orbits including meningioma, optic/chiasmal glioma, orbital haemangioma, and benign mixed tumour of the lacrimal gland
• To describe the imaging features and basic clinical features of malignant tumours of the orbits including ocular melanoma, orbital lymphoma, higher grade optic / chiasmal glioma, adenoid cystic carcinoma of the lacrimal glands

Orbit and visual pathways: hela detta avsnitt gäller fördjupning inom neuroradiologi/ST i neuroradiologi.

NOSE, NASOPHARYNX AND PARANASAL SINUSES
• To describe the imaging features and basic clinical features of congenital lesions of the paranasal sinuses including choanal atresia and frontoethmoidal encephalocele ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To differentiate normal variants of the nose and paranasal sinuses from pathology
• To describe the imaging features and basic clinical features of infectious and inflammatory disorders of the nose and paranasal sinuses including acute and chronic rhinosinusitis, fungal sinusitis, sinonasal polyposis, sinonasal mucocele and sinonasal Wegener granulomatosis ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To be aware of typical complications of infectious and inflammatory disorders of the nose and paranasal sinuses
• To list and describe the typical surgical approaches to the nose and paranasal sinuses including functional endoscopic sinus surgery (FESS) ***(fördjupning i neuroradiologi/ST i neuroradiologi)***

• To describe the imaging features and basic clinical features of benign and malignant neoplasms of the nose and paranasal sinuses including inverted papilloma, juvenile angiofibroma, sinonasal hemangioma, sinonasal osteoma, sinonasal fibrous dysplasia, sinonasal squamous cell carcinoma, sinonasal adenocarcinoma, sinonasal melanoma, esthesioneuroblastoma, and sinonasal lymphoma ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the typical imaging features of the nose and paranasal sinuses after surgery ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To describe the imaging features and basic clinical features of the nasopharyngeal pathologies including Thornwaldt cyst, inflammatory and infectious lesions and neoplasms ***(fördjupning i neuroradiologi/ST i neuroradiologi)***

Nose, nasopharynx and paranasal sinuses: detta avsnitt gäller framförallt fördjupning i neuroradiologi/ST i neuroradiologi med undantag av de kriterier som inte är kommenterade och därmed gäller för alla som gör ST-utbildning i radiologi.

MASTICATOR SPACE, PAROTID SPACE AND CAROTID SPACE
• To describe the anatomical delineations of the masticator space, parotid space and carotid space
• To describe pseudolesions of the masticator space, including denervation atrophy, benign muscle hypertrophy and asymmetries of the pterygoid venous plexus
• To describe the typical imaging features of abscess formations of the masticator space
• To describe the imaging features and basic clinical features of benign and malignant neoplasms of the masticator space including peripheral nerve sheath tumours of the trigeminal nerve
• To describe the imaging features and basic clinical features of infectious and inflammatory lesions of the parotid space including parotitis, Sjogren syndrome and benign lymphoepithelial lesions in patients with HIV
• To describe the imaging features and basic clinical features of benign and malignant neoplasms of the parotid space including Warthin tumour, benign mixed tumour, adenoid cystic carcinoma, mucoepidermoid carcinoma, lymphoma, lymph node metastases and malignant tumors of the skin
• To describe the imaging features and basic clinical features of vascular lesions of the carotid space including ectatic carotid arteries, carotid artery pseudoaneurysm, carotid artery dissection, and jugular venous thrombosis
• To describe the imaging features and basic clinical features of neoplasms of the carotid space including carotid body paraganglioma, glomus vagale paraganglioma, schwannoma, and neurofibroma

Masticator space, parotid space and carotid space: detta avsnitt gäller framförallt fördjupning i neuroradiologi/ST i neuroradiologi med undantag av första punkten: 'To describe the anatomical delineations of the masticator space, parotid space and carotid space' som gäller för alla som gör ST-utbildning i radiologi.

LYMPH NODES OF THE HEAD AND NECK REGION
• To have an in-depth understanding of the nomenclature of the lymph nodes and nodal regions

• To describe the imaging features and basic clinical features of infectious and inflammatory disorders of the lymph nodes including reactive lymph node enlargement, suppurative lymph nodes, Kimura disease, and Castleman disease
• To describe the imaging features and basic clinical features of neoplastic disorders of the lymph nodes, including lymphoma (Hodgkin and Non-Hodgkin) and nodal metastases
• To be familiar with PET-CT imaging findings in benign and malignant lymph nodes

Lymph nodes of the head and neck region: hela detta avsnitt gäller fördjupning inom neuroradiologi/ST i neuroradiologi.

ORAL CAVITY, OROPHARYNX AND RETROPHARYNGEAL SPACE
• To describe the imaging features and basic clinical features of congenital lesions of the oral cavity and oropharynx, including dermoid and epidermoid cysts, accessory salivary tissue, lymphangioma and lingual thyroid gland
• To describe the imaging features and basic clinical features of inflammatory and infectious lesions of the oral cavity and oropharynx, including abscesses, retention cysts, sialoceles, sialadenitis and ranula
• To describe the imaging features and basic clinical features of benign and malignant neoplasms of the oral cavity and oropharynx, including benign mixed tumours, squamous cell carcinoma, malignant tumours of the minor salivary glands
• To describe the typical imaging features and clinical presentation of retropharyngeal abscesses

Oral cavity, oropharynx and retropharyngeal space: hela detta avsnitt gäller fördjupning inom neuroradiologi/ST i neuroradiologi, förutom den sista punkten: 'To describe the typical imaging features and clinical presentation of retropharyngeal abscesses' vilken gäller för alla som gör ST-utbildning i radiologi.

HYPOPHARYNX AND LARYNX
• To describe the imaging features and basic clinical features of neoplasms of the hypopharynx and larynx, including squamous cell carcinoma of the phypopharynx, squamous cell carcinomas of the supraglottic, glottic and subglottic regions, and chondrosarcomma of the larynx
• To describe the typical imaging features of the hypopharynx and larynx after surgery and after radiation
• To describe the imaging features of vocal cord paralysis
• To describe the potential efects and the respective imaging features of laryngeal trauma
• To list the imaging features, causes and clinical consequences of tracheal stenoses
• To describe the imaging features of laryngoceles and pharyngoceles
• To describe functional abnormalities of the larynx and hypopharynx during impaired swallowing including primary and secondary aspiration and dysfunction of the crico-pharyngeal muscle
• To be familiar with PET-CT findings in head and neck tumours involving the pharynx, larynx and oral cavity

Hypopharynx and larynx: hela detta avsnitt gäller för fördjupning inom neuroradiologi/ST i neuroradiologi, förutom punkten 'To describe functional abnormalities of the larynx and hypopharynx during impaired swallowing including primary and secondary aspiration and dysfunction of the crico-pharyngeal muscle' vilken gäller för alla som gör ST-utbildning i radiologi.

THYROID AND PARATHYROID GLANDS AND VISCERAL LESIONS
• To describe the imaging features and basic clinical features of thyroiditis
• To describe the imaging features and basic clinical features of multinodular goiter
• To describe the imaging features and basic clinical features of benign and malignant neoplasms of the thyroid and parathyroid glands, including thyroid and parathyroid adenomas, different types of thyroid carcinoma, and thyroid lymphoma
• To describe the imaging features and basic clinical features of cervical oesophageal carcinoma
• To describe the imaging features and basic clinical features of a Zenker diverticulum and the typical approaches to therapy
• To be familiar with the most important findings of Tc-99m-scintigraphy in various diseases of the thyroid gland

Thyroid and parathyroid glands and visceral lesions: i detta avsnitt gäller punkterna om multinodulär struma, esofagus carcinom och Zenker-divertikel för alla som gör ST-utbildning i radiologi.

CONGENITAL AND TRANSSPATIAL LESIONS
• To have a basic understanding of the embryology of the head and neck region
• To describe the imaging features and basic clinical features of branchial cleft cysts
• To describe the imaging features and basic clinical features of thyroglossal duct cysts
• To describe the imaging features and basic clinical features of thymus cysts
• To describe the imaging features and basic clinical features of vascular lesions including malformations of the head and neck region
• To be familiar with the imaging manifestations of neurocutaneous syndromes, including neurofibromatosis type I, in the head and neck region
• To describe the imaging features and basic clinical features of fibromatosis colli

Congenital and transspatial lesions: hela detta avsnitt gäller för fördjupning inom neuroradiologi/ST i neuroradiologi, förutom första punkten 'To have a basic understanding of the embryology of the head and neck region', vilken gäller för alla som gör ST-utbildning i radiologi.

SKILLS

• To choose the most appropriate imaging examination according to the clinical problem in head and neck imaging
• To choose the most suitable contrast material and its optimal use according to the imaging technique and the clinical problem in head and neck imaging
• To perform dynamic functional studies including video-fluoroscopy of the swallowing mechanism
• To ascertain correct positioning for imaging studies of the skull, sinus, skull base, and facial bones including special views

• To perform ultrasound including Doppler sonography of the neck, tongue, thyroid and salivary glands
• To perform percutaneous biopsy, guided by ultrasound or CT in straightforward/technically easy cases
• To perform fine needle aspiration biopsy in easy cases
• To perform lymph node aspiration biopsies in easy cases
• To observe and/or perform under supervision percutaneous biopsy, guided by ultrasound, CT and/or MRI in more complex cases
• To observe and/or perform under supervision dacryocystography
• To observe and/or perform under supervision fine needle aspiration biopsy in more complex cases ***(rekommenderas om möjligt men ej krav)***
• To observe and/or perform under supervision lymph node aspiration biopsies in more complex cases ***(rekommenderas om möjligt men ej krav)***
• To perform dental radiology ***(utgår)***
• To confidently plan a CT examination of the head and neck region and to tailor it to the individual situation in regard to intravenous contrast medium, rate of injection, dose and delay of the contrast medium, with a dose as low as reasonably achievable
• To confidently plan a CT examination of the temporal bone and to tailor it to the individual situation in regard to the potential use of intravenous contrast medium and spatial resolution ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To confidently plan an MRI examination of the head and neck region and to tailor it to the individual situation in regard to the potential use of intravenous contrast medium, rate of injection, dose and delay of the contrast medium, and spatial resolution
• To confidently plan an MRI examination of the temporal bone and to tailor it to the individual situation in regard to the potential use of intravenous contrast medium and spatial resolution ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To apply techniques for quantification of head and neck disorders using ultrasound, CT and MRI, based on an in-depth understanding of their clinical role and limitations ***(fördjupning i neuroradiologi/ST i neuroradiologi)***
• To confidently perform proper post-processing tasks for head and neck imaging studies, including multi-planar reformations (MPR), maximum intensity projections (MIP), minimum intensity projections (MinIP), vessel analysis tools, endoluminal reconstructions, 3D reconstructions including volume rendering and virtual endoscopy and multimodality fusion of images ***(fördjupning i neuroradiologi/ST i neuroradiologi)***

Skills: detta avsnitt gäller för alla som gör ST-utbildning i radiologi med undantag av de kommenterade kriterierna

COMPETENCES AND ATTITUDES

• To confidently justify diagnostic imaging examinations and/or interventional procedures of the head and neck region
• To confidently choose the best-suited method for evaluating disorders of the head and neck region
• To communicate with the patient in order to obtain informed consent prior to diagnostic imaging and interventional procedures of the head and neck region

• To confidently choose optimal imaging parameters for radiographic, ultrasonographic, CT and MRI examinations of the head and neck region
• To confidently apply techniques to reduce exposure doses for radiographic and CT examinations of the head and neck region
• To confidently design imaging protocols and standard operating procedures for CT examinations of the head and neck region, including the appropriate application of intravenous contrast, spatial and temporal resolution
• To confidently design imaging protocols and standard operating procedures for MRI examinations of the head and neck region, including the appropriate application of intravenous contrast, spatial and temporal resolution
• To supervise and teach technical staf to ensure that appropriate images of the head and neck region are obtained
• To confidently judge the quality of the imaging examinations in head and neck imaging and to devise strategies to improve image quality
• To confidently interpret and report radiographs, ultrasonographic examinations, CT studies and MRI examinations of the head and neck region
• To report oncological studies of the head and neck region according to international standards (e.g. TNM) applicable to the specific situation
• To appreciate own limitations and to identify when it is appropriate to obtain assistance in interpreting and reporting images of the head and neck region
• To confidently identify urgent and/or unexpected findings in imaging examinations of the head and neck region and to communicate these timely and properly
• To communicate with patients and their relatives in order to explain the imaging findings of the head and neck region
• To take an active part and/or conduct multi-disciplinary conferences and tumour boards for diseases of the head and neck region

Competences and attitudes: Detta avsnitt gäller för alla som gör ST-utbildning i radiologi inom de områden som identifierats under 'Knowledge' och 'Skills'.

För de som fördjupar sig inom neuroradiologi/påbörjar ST i neuroradiologi gäller hela avsnittet 'Competences and attitudes' level II.

Level III

B-III-9 Neuroradiology

För de som genomgår ST-utbildning i grenen neuroradiologi ingår level II neuroradioogi och level II för head and neck med aktuella kommentarer.

KNOWLEDGE

Angående teknikerna fMRI, DTI, MRS och hybridteknikerna krävs god kännedom om metoderna och förmåga att självständigt kunna handlägga och bedöma sådana undersökningar.

SKILLS

Utförande av fMRI och MRS sker genom multidisciplinärt samarbete.
Diagnostic angiography är inte ett krav att utföra, men ska observeras.
Image guided biopsies: inget krav att utföra men att observera.
Ha kunskap om kvantitativ bildanalys och dess för- och nackdelar.
Vetenskapligt arbete som är godkänt inom ST för radiologi (eller motsvarande) är tillräckligt.

ADDITIONAL IN NEUROINTERVENTIONAL TRAINING
Svensk förening för neuroradiologi anser att man bör följa UEMS's rekommendationer (hemsidan under Education) för utbildning till interventionell neuroradiolog varför dessa punkter inte är relevanta.

ADDITIONAL IN INTERVENTIONAL SPINE TRAINING
Vid inriktning mot intervention.

ADDITIONAL IN NEUROPAEDIATRIC TRAINING
Vid inriktning mot barnneuroradiologi.

COMPETENCES AND ATTITUDES

Hela avsnittet ingår.